VERMONT
DEPARTMENT OF HEALTH

Cervical Cancer in Vermont

Vermont Cancer Registry
Chronic Disease Epidemiology

May 2007

Vermont Facts, 1999-2003

- **Incidence:** Cervical cancer is the twelfth most common cancer diagnosed in women. Each year approximately 29 cervical cancer cases are diagnosed in women.
- **Age:** Generally the risk for developing cancer increases with age, however, women of all ages are at risk for developing cervical cancer.
- **Mortality:** Cervical cancer is the thirteenth leading cause of cancer death among women. Each year, approximately eight women die from cervical cancer.
- **Vermont vs. U.S.:** The cervical cancer incidence rate in Vermont is higher than the U.S. rate. Mortality rates among Vermont women are not different from the U.S.
- **Yearly Trends (1994-2003):** Incidence of cervical cancer has decreased in Vermont and the U.S.
- **Stage:** There is no difference between Vermont and the U.S. for stage at diagnosis. In Vermont, 56 percent of cervical cancers are diagnosed at the localized stage (the cancer is limited to the organ of origin), compared to 52 percent among U.S. women. Among Vermont women with cervical cancer, 35 percent are diagnosed at the regional or distant stage (the cancer has extended beyond the local organ or has metastasized) compared with 43 percent of U.S. women.
- **Advanced Stage (1994-2003):** As a measure of screening effectiveness, cervical cancer incidence for women diagnosed at advanced stage (regional or distant stage) is not different from the U.S. Vermont women age 60 and over are more likely to be diagnosed with advanced stage cervical cancer compared to younger women.
- **Screening:** According to the 2005 BRFSS, 83% of Vermont women have met the screening recommendations for cervical cancer. However, certain subgroups, older women, those that lack health insurance, have less than a high school education, or women who lack a personal doctor have lower rates of screening.

Table of Contents:

Background

In Vermont, cancer is the second leading cause of death, with approximately 1,235 people dying from cancer each year. For the past 40 years, the three leading causes of death in Vermont have been heart disease, cancer, and stroke. Unlike the death rates for heart disease and stroke, the death rate for cancer has risen steadily over the last few decades. Roughly one out of every two men and one out of every three women will develop cancer in their lifetime. By monitoring cancer in Vermont we can become better informed of progress towards preventing and treating cancer, and ultimately, reduce illness and death from cancer.

Cervical Cancer

Cervical cancer occurs primarily among women infected with the human papillomavirus (HPV). Cervical cancer results when cells in the lining of the cervix (the lower, narrow end of the uterus, or womb) go through abnormal changes that grow and spread more deeply into the cervix and to surrounding areas. Cervical cancers do not form suddenly. Normal cervical cells gradually develop pre-cancerous changes that can develop into cancer. Since the Pap test was widely adopted in the U.S. in the 1950's, early detection of these early cellular changes has been credited with a significant decrease in the incidence of invasive cervical cancer and mortality from the disease.

Incidence

Defined as the number of *new* cases occurring in a population during a defined time interval, incidence rates are a useful measure of the risk of disease[1].

Table 1. The five most commonly diagnosed cancers in females – Vermont, yearly averages 1999-2003.

Female Cancer Site	Cases (per year)	Percent (per year)
Breast	482	31%
Lung	176	11%
Colon and Rectum	173	11%
Uterus	112	7%
Melanoma	80	5%
•	•	•
•	•	•
•	•	•
Cervix	**29**	**2%**
All Sites	1,538	100%

New cases per year exclude basal cell and squamous cell skin cancers and in situ (malignant but non-invasive) carcinomas except urinary bladder.

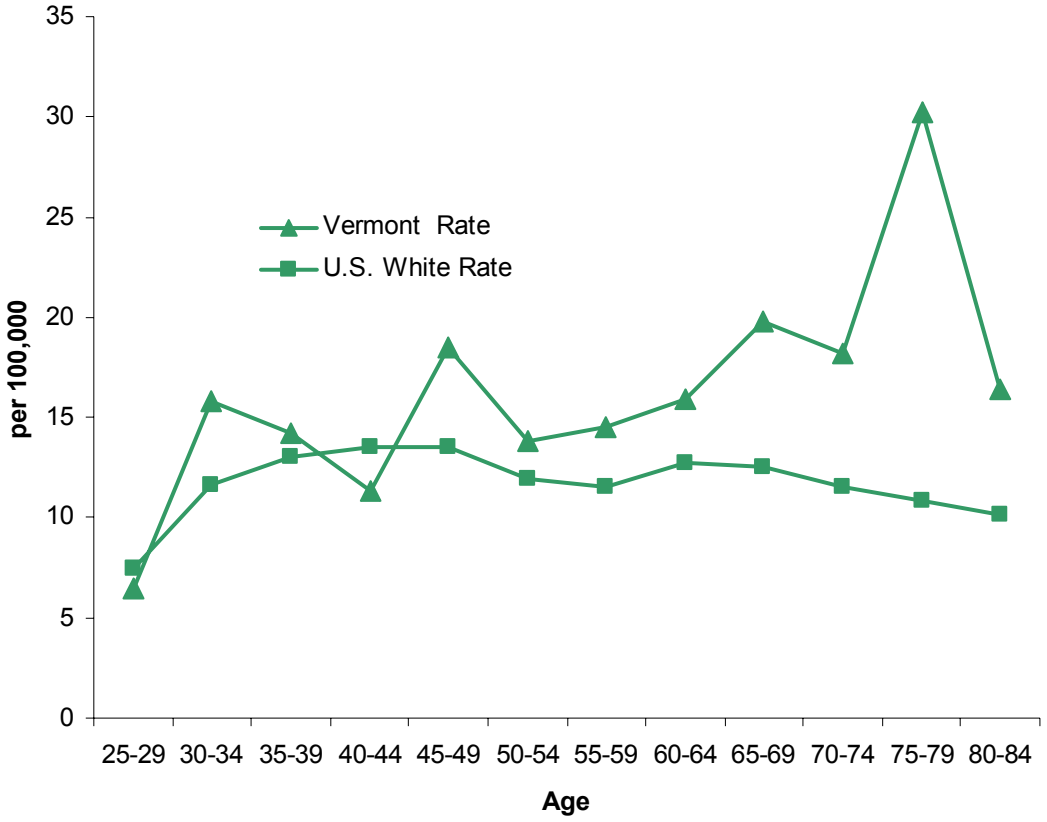
- An average of 1,538 females are diagnosed with invasive cancer each year in Vermont. Of those, an average of 29 women are diagnosed with cervical cancer each year.
- Cervical cancer is the twelfth most common cancer diagnosed in females and accounts for roughly 2% of all cancers diagnosed in Vermont.

[1] The data provided in this report are for invasive cases only; in situ (non-invasive) and cervical dysplasia are not reportable.

Age

In the U.S. there has been a leveling of rates after the age of 40, an unusual pattern of age related risk compared to that of other similar cancers. However, in Vermont the incidence of cervical cancer increases with age, occurring most often in women over the age of 40.

Figure 1. Incidence rates of female cervical cancer, by age – Vermont and United States, 1994-2003.



Age Group	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84
Vermont Rate	6.5	15.8	14.2	11.3	18.5	13.8	14.5	15.9	19.8	18.2	30.2	16.4
U.S. White Rate	7.5	11.6	13.0	13.5	13.5	11.9	11.5	12.7	12.5	11.5	10.8	10.1

Incidence excludes in situ (malignant but non-invasive) carcinomas. All rates are age-adjusted to the 2000 U.S. standard population. The U.S. incidence rates are based on the SEER Cancer Incidence Public Use Database and are white population rates. From 1994-2003, there were too few cases of cervical cancer in Vermonters younger than 25 years old and older than 84 to report. Rates are only presented when the number of cases in a particular age group is at least 6.

- Vermont women age 75-79 have the highest age-specific incidence of cervical cancer, at a rate of 30.2 per 100,000.
- Vermont women age 75-79 have higher incidence rates of cervical cancer compared to the U.S.

Mortality

The mortality rate is a measure of the number of deaths (due to cancer) in a population during a specific period of time.

Table 2. The five most common causes of cancer death in females – Vermont, yearly averages 1999-2003.

Female Cancer Site	Deaths (per year)	Percent (per year)
Lung	139	23%
Breast	96	16%
Colon and Rectum	70	12%
Pancreas	30	5%
Ovary	29	5%
•	•	•
•	•	•
•	•	•
Cervix	**8**	**1%**
All Sites	596	100%

- An average of 596 females die each year from cancer in Vermont. Of these, an average of 8 women die each year of cervical cancer.
- Cervical cancer is the thirteenth leading cause of cancer death for females.
- Cervical cancer accounts for roughly 1% of all cancer deaths among females in Vermont.

U.S. Comparisons

Table 3. Incidence and mortality rates of cervical cancer – Vermont and United States, per 100,000, yearly averages, 1999-2003.

	Incidence	Mortality
Vermont Females	8.7	2.3
U.S. Females	7.2	2.4

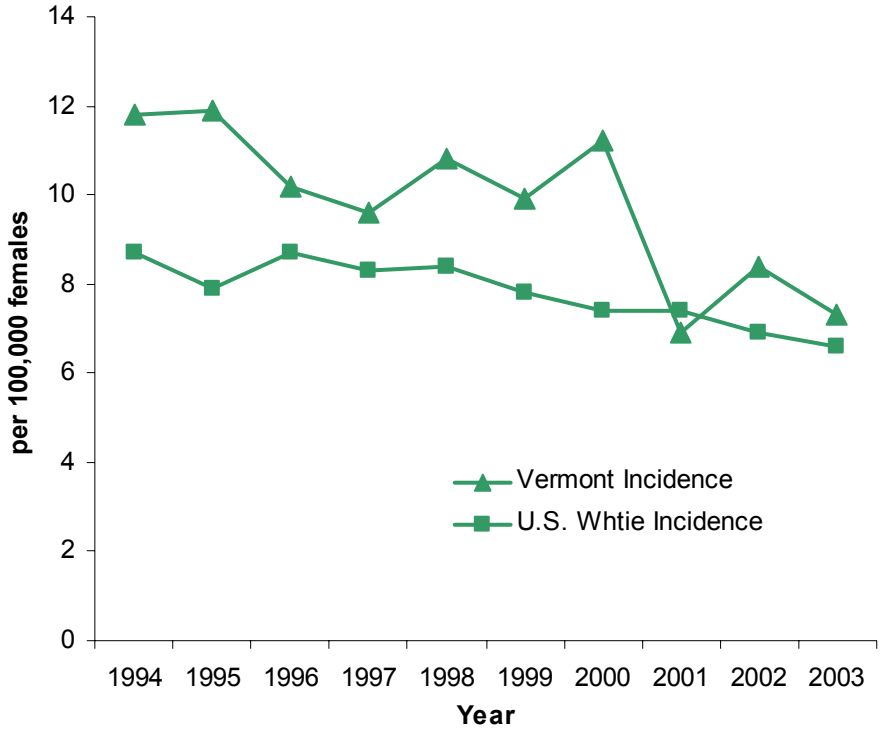
Incidence excludes in situ (malignant but non-invasive) carcinomas. All rates are age-adjusted to the 2000 U.S. standard population. The U.S. mortality rates are based on the Vital Statistics System of the United States Public Use database and are white population mortality rates. The U.S. incidence rates are based on the SEER Cancer Incidence Public Use Database and are white population rates.

- Cervical cancer incidence in Vermont is higher than the U.S.
- The cervical cancer mortality rate in Vermont is not different from the U.S.

Trends

Cervical cytology, also called a Pap smear, was developed in 1940 by George Papanicolaou and became widely used starting in the 1950's. It involves sampling the cells at the transformation zone of the cervix, the area where squamous epithelial cells change to squamocolumnar cells. The Pap test detects signs of cervical cancer and pre-cancerous lesions that can be treated before they become invasive cervical cancer. There is good evidence from studies that screening reduces incidence of and mortality from cervical cancer. Since the Pap test was widely adopted in the U.S. in the 1950's, it has been credited with a 50 percent decrease in the incidence of cervical cancer and a 70 percent decrease in the cervical cancer death rate.

Figure 3. Incidence rates of cervical cancer – Vermont and United States, 1994-2003.



	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Vermont Rate	11.8	11.9	10.2	9.6	10.8	9.9	11.2	6.9	8.4	7.3
U.S. White Rate	8.7	7.9	8.7	8.3	8.4	7.8	7.4	7.4	6.9	6.6

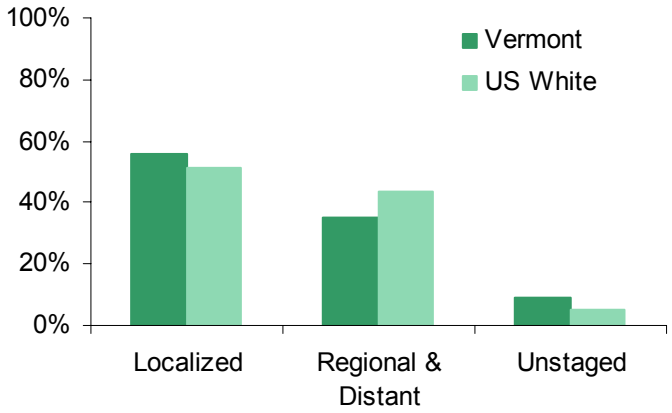
Incidence excludes in situ (malignant but non-invasive) carcinomas. All rates are age-adjusted to the 2000 U.S. standard population. The U.S. incidence rates are based on the SEER Cancer Incidence Public Use Database and are white population rates.

- From 1994 to 2003, trend analysis shows that the female cervical cancer incidence rates decreased in Vermont and the U.S.

Stage at Diagnosis

Stage describes the extent to which the cancerous cells have spread from the original site to another part of the body. Stage is grouped into the following categories: localized, regional, distant, and unknown. Early detection is the goal of cervical cancer screening. If cervical abnormalities are diagnosed before they become cancer, or before the develop into advanced cancer, the chances for survival are greater. Nationally, 92% of women whose cervical cancer is diagnosed in a localized stage survive their cancer for at least five years. Only 15% of women diagnosed with distant stage cervical cancer survive for at least five years.

Figure 4. Distribution of cervical cancer by stage at diagnosis – Vermont and the United States, 1999-2003.

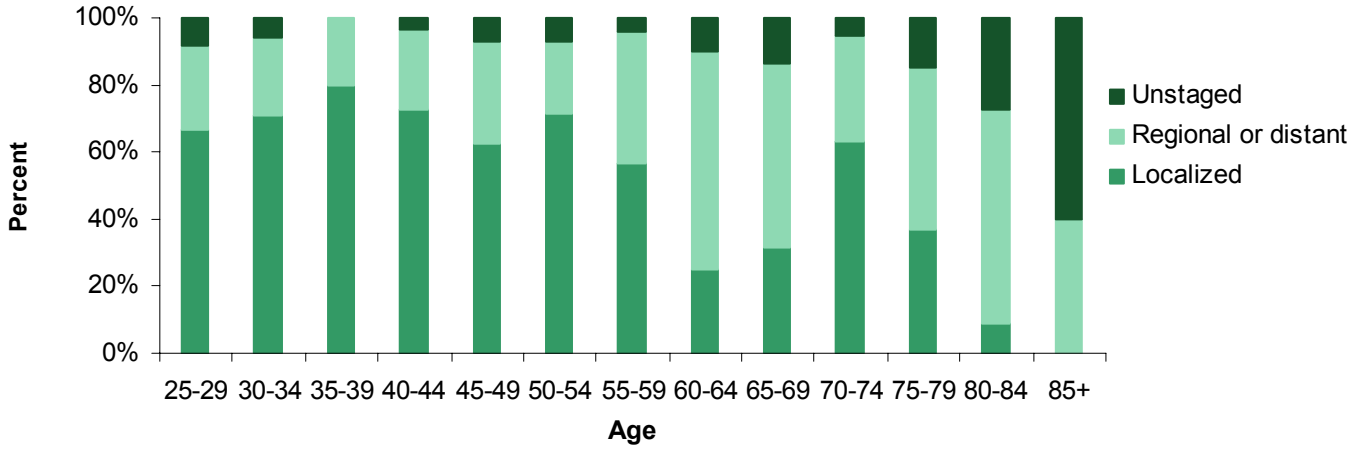


New cases per year exclude in situ (malignant but non-invasive) carcinomas.

- Approximately 56 percent of cervical cancers were diagnosed among Vermont females at the early stage (localized) and 35 percent were diagnosed at a regional or distant stage. In the U.S., 52 percent of cervical cancers were diagnosed at the early stage and 43 percent were diagnosed at a regional or distant stage among white females.

- There is no difference between Vermont and the U.S. for stage at diagnosis.

Figure 5. Distribution of cervical cancer by stage at diagnosis and age – Vermont , 1994-2003.

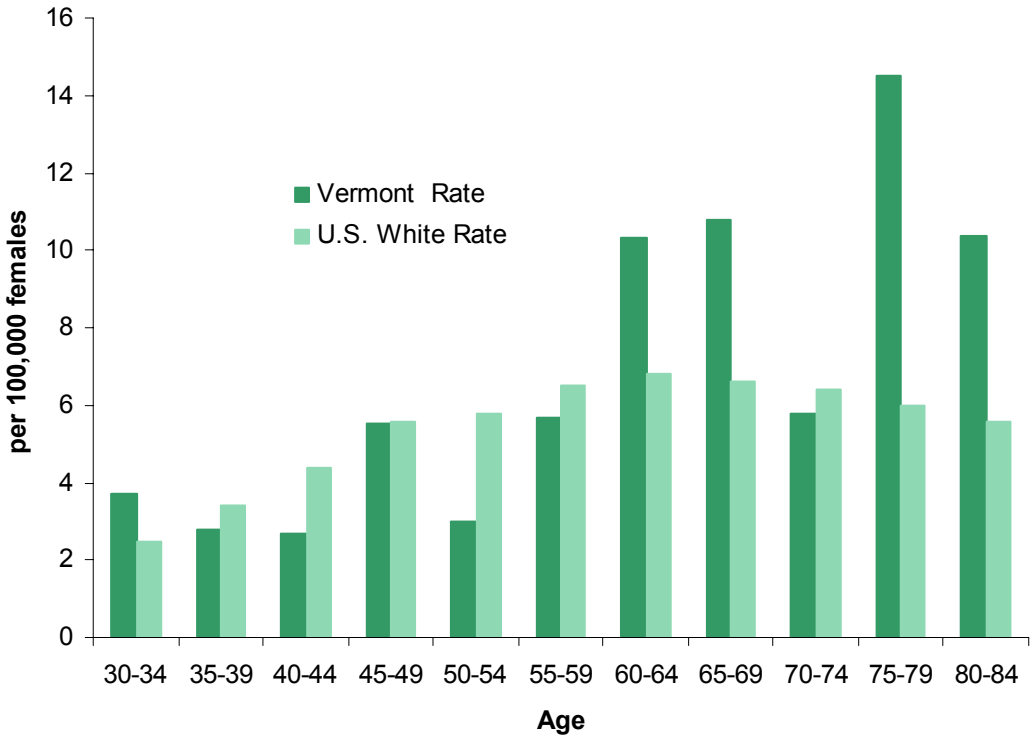


- The percentage of cervical cancers diagnosed in the regional or distant stages increases with age.

Advanced Stage Diagnosis

The rate of cases of cancer that are diagnosed at late or advanced stage (regional or distant) is a measure of the effectiveness of cancer screening efforts.

Figure 6. Incidence rates of advanced stage cervical cancer (age 20+) - Vermont and the United States, 1994-2003.



- Between 1994 and 2003 the Vermont rate of advanced stage cervical cancer among women age 20 and older (4.6 per 100,000) was not different from the U.S. rate (4.2 per 100,000).
- Women age 75-79 experience the highest age specific incidence of advanced stage cervical cancer at a rate of 14.5 per 100,000 and is higher than the U.S. rate of 6.0 per 100,000.

Risk Factors

A risk factor is a condition, an activity, or an exposure that is associated with an increased risk of developing a disease. Cancer develops gradually as a result of a complex mix of factors related to lifestyle choices, environment and genetics. Each type of cancer is caused by a different set of factors, some well established, some uncertain, and some unknown. While the exact cause of most cancers is unknown, researchers have identified risk factors that may increase a person's chance of getting certain cancers.

Human papillomavirus (HPV) infection is an essential factor in the development of nearly all cases of cervical cancer. Certain strains of this virus can cause cells on the cervix to change, resulting in cervical dysplasia, and over time these cells may become malignant. There are over 100 different strains of HPV, and more than 30 of them are sexually transmitted. Other types of HPV are responsible for genital warts and some "high risk" strains can produce the changes in the cervix that cause cancer.

HPV Prevention

HPV infection is very common. About 20 million men and women in the US are infected with HPV, and each year approximately 6.2 million Americans acquire a new infection. Researchers estimate that, by the age of 50, at least 80 percent of adults have had an HPV infection during their lifetime. Despite the large numbers of women with HPV infection, relatively few develop cervical cancer. This is because not all strains of HPV cause cervical cancer, and most women's bodies can effectively fight the virus. Most people with an HPV infection have no symptoms, and therefore are unaware that they can transmit the virus to a sex partner. Recently, efforts towards eliminating cervical cancer by preventing HPV have focused in two areas:

- Safer Sexual Practices: Cervical cancers resulting from HPV infections, are typically sexually transmitted. Sexual abstinence is the only way to virtually eliminate cervical cancer risk. However, for individuals who choose to be sexually active, safer sex (consistent condom use) will help to reduce overall risk. Additional strategies to reduce risk include delaying age at first sexual contact, limiting the number of sexual partners or being in a long-term, mutually monogamous relationship with an uninfected partner.

- HPV Vaccines: On June 8, 2006, the US Federal Drug Administration (FDA) approved the first vaccine to prevent HPV infection in women. This first quadrivalent vaccine protects against four types of HPV, two of which are known to lead to about 70% of cervical cancers. The two other strains account for 90% of genital warts. A second bivalent vaccine is effective against the two HPV strains that cause the most cervical cancers and is currently awaiting FDA approval.

In 2006, the Advisory Committee on Immunization Practices (ACIP), a group of 15 experts chosen by the Secretary of the U.S. Department of Health and Human Services, made recommendations to the Centers for Disease Control and Prevention (CDC) on the most effective ways to prevent vaccine-appropriate diseases. To ensure maximal efficacy, the Committee recommended that the HPV vaccine be initially administered to girls age 11-12 years, prior to the onset of sexual activity. At the discretion of a healthcare provider, it can be administered to females between the ages of 9 and 26. The vaccine is currently not approved for use in males. These recommendations are supported by the American Cancer Society.

Risk Factors for Progression of HPV Infection to Cervical Cancer

While screening for cervical cancer through the use of the Pap test is the most effective way of decreasing the risk of progression to cervical cancer, it is important to note that some women are at increased risk of progression from HPV infection to cervical cancer due to the following risk factors:

- Weakened Immune System: Women with Human Immunodeficiency Virus (HIV) infection have a suppressed immune system, which makes it hard to fight infections such as HPV, and early cancers.

- Age: While HPV infection is less prevalent in older women, if undiagnosed it can progress to cervical cancer more readily. In Vermont, women aged 75 to 79 have the highest age-specific incidence of cervical

cancer. Rates of late stage diagnosis are also highest among Vermont women age 75-79 compared to the U.S. This points to the need to continue screening women beyond the age of 65 for cervical cancer, and to examine for other gynecological health issues.

- Smoking: Women who smoke cigarettes are about twice as likely to get cervical cancer as non-smokers. The carcinogenic chemicals in tobacco can damage the DNA in cervical cells, making smokers more prone to developing cancer. In addition, current smokers in Vermont report lower rates of screening for cervical cancer than non-smokers.

- Exposure to DES (diethylstilbestrol): Between 1940 and 1971, health care providers prescribed DES to women who were vulnerable to miscarriage. The daughters of women who took DES have a slightly increased risk of vaginal or cervical cancer.

Prevention and Screening

Since few women with cervical cancer have symptoms or signs that indicate a problem, widespread screening for early detection is critical. Cervical cancer is one of the few cancers that can actually be prevented by receiving screening tests. Abnormalities can be detected and treated before they progress to cancer.

As part of the Vermont State Cancer Plan 2006-2010 and Healthy Vermonters 2010, the objective is to increase percentage of women (age 18+) who have had a Pap test in the past three years.

Goal:	90 percent
VT 2005:	83 percent

The Pap test includes the traditional smear and the new liquid-based cytology, both done by a health care provider. During a pelvic exam, the clinician scrapes cells from a woman's cervix and sends them to a laboratory to identify changes or abnormalities. The cost of an annual gynecological exam and Pap test (approximately $200) is a fraction of the cost for cervical cancer treatment (approximately $20,000 per person in the first year of diagnosis)[2]. Each time a woman has a new sexual partner she has a 15 percent chance of getting this virus, and multiple sexual partners or a change in partners increases her risk[3].

Screening Schedules

There is general agreement among standard-setting organizations for when to begin and how often to screen for cervical cancer. However, there is disagreement as to when regular screenings can be ended. In 2002, the American Cancer Society (ACS), along with the American College of Obstetricians and Gynecologists (ACOG) issued formal recommendations about cervical cancer screening, which included:

- Pap tests should be started within three years of vaginal intercourse, or at least by age 21, in order to detect and treat the disease early.

According to ACOG:

- Pap tests should be done annually until age 30. After 30, if a healthy woman has had three completely normal and satisfactory Pap tests, she may be able to increase the test interval to every two to three years (but should still see a gynecologist every year for an exam).

Shortly following the ACS and ACOG recommendations, the United States Preventive Services Task Force (USPSTF)[4] released updated recommendations on screening for cervical cancer. These recommendations

[2] National Cancer Institute. http://progressreport.cancer.gov

[3] Killackey, Maureen. *New Cervical Cancer Screening Guidelines: Do The Right Thing*. http://www.acog.org

[4] U.S. Preventive Services Task Force. *Guide to Clinical Preventive Services, Third Edition: Screening for Cervical Cancer*. http://www.ahrq.gov/clinic/3rduspstf/cervcan/cervcanrr.pdf

are used as guidelines for women's health care providers across the United States. The document states:

- ❖ A majority of cases of invasive cervical cancer occur in women who are not adequately screened. Clinicians, hospitals, and health plans should develop systems to identify and screen the subgroup of women who have had no screening or who have had inadequate past screening.

Among Vermont women, cervical cancer incidence increases after the age of 40. This points to the need to continue screening women beyond the age of 65 for cervical cancer, and to examine for other gynecological health issues.

Barriers to Cervical Cancer Screening

In Vermont, screening rates have declined from 86 percent in 2000 to 83 percent in 2006. Furthermore, certain populations report lower rates of cervical cancer screening. The following variables continue to be significant predictors of cervical cancer screening:

- **Lack of a personal doctor:** 83.8% of women with a personal doctor are get screened for cervical cancer compared to 65.9% of those without a personal doctor.
- **Health insurance:** 84.1% of women with health insurance get screened for cervical cancer compared to 73.7% of those without insurance.
- **Age:** Women between the ages of 25-44 have the highest rates of cervical cancer screening. Only about half of Vermont women age 65 and older report having a Pap test in the past three years.
- **Educational status:** Cervical cancer screening rates increase with education. Only about 70% of women who did not finish high school have had a Pap test in the past three years, compared to 87.2% of women who have completed college.

HPV Testing

The HPV test, approved in 2000, examines cervical cells for DNA of 13 high-risk strains of HPV associated with cervical cancer. This test was originally used only for women with abnormal Pap tests to determine the need for more testing. In March, 2003, the U.S. Federal Drug Administration approved the use of the HPV test in combination with a Pap test for screening women over 30 years of age, along with a complete medical history and an evaluation of other risk factors.

The United States Preventative Services Task Force (USPSTF) was unable to make recommendations regarding the routine use of new technologies to screen for cervical cancer or HPV testing as an adjunct or alternative to regular Pap smear screening. The reasons are that these new tests are costly, and have not been available long enough for researchers to conduct prospective studies. The CDC is currently undertaking a large cost-benefit analysis of the use of HPV testing as a primary screening tool. Preliminary results are expected in the next two years.

Intervention, Policy, and Recommendations

The **Vermont Ladies First Program**[5] provides low-income, uninsured, and underserved women access to timely, high-quality screening and diagnostic services to detect breast and cervical cancer at the earliest stages. This program is funded by the Center for Disease Control's (CDC) National Breast and Cervical Cancer Early Detection Program (NBCCEDP). Based on federal guidelines, the program provides services to uninsured and underinsured women at or below 250% of the federal poverty line. The Vermont program provides cervical cancer screening to women ages 18 – 64. Between January 2001 and December 2005, the Ladies First Program provided cervical cancer screening to 4,653 Vermont women. The program diagnosed 180 women with cervical cancer or cervical dysplasia (pre-cancer changes in cervical cells).

[5]For membership and eligibility information visit http://healthvermont.gov/prevent/ladies_first.aspx or contact Ladies First at 1-800-508-2222.

Treatment for cancer is costly, and many private health insurance plans will pay a percentage of the fees. However, these costs are insurmountable for the millions of Americans who are uninsured. In recognition of the complexity of the issue of treatment costs, coverage and access to care, the United States Congress passed the Breast and Cervical Cancer Prevention and Treatment Act in 2000. In addition to providing funds for screening and diagnostic testing as discussed earlier, the "Medicaid Treatment Act" allows states to provide medical assistance through Medicaid to eligible women who were screened through a CDC program like Ladies First, if they were found to have breast or cervical cancer or pre-cancerous conditions. Vermont passed legislation in 2001 to adopt this Act. In order for a woman to be eligible for Medicaid under this Act, she must have been screened for and found to have breast or cervical cancer (including precancerous conditions) through Ladies First, be under age 65, be uninsured and otherwise not eligible for Medicaid.

The Vermont State Cancer Plan[6], published by the Vermont Department of Health and **Vermonters Taking Action Against Cancer (VTAAC)**[7], provides a strategic roadmap to reduce the burden of all cancers by 2010. The Plan identifies strategic priorities in the following areas: preventing future cancers, detecting new cancers early, increasing access to optimal treatment and follow up, improving the quality of life for cancer survivors, and improving pain management and end-of-life care.

The burden of cervical cancer in Vermont can be reduced by achieving the following objectives, as identified in the State Cancer Plan:

Prevent future cancers by reducing exposure to known risk factors including:
- Decrease the prevalence of tobacco smoking among all Vermonters.
- Decrease the prevalence of obesity among all Vermonters.
- Increase daily fruit and vegetable consumption among all Vermonters.
- Increase regular, moderate physical activity among all Vermonters.

Detect new cancers as early as possible through appropriate screening:
- Increase cervical cancer screening among Vermont women.

Increase access to optimal cancer treatment and follow-up care:
- Increase referrals for multi-modality treatment assessment.
- Reduce financial, geographic and cultural barriers to appropriate cancer treatments.
- Increase availability and use of transportation services to access cancer treatment.
- Increase participation in therapeutic clinical trials.
- Increase the proportion of Vermonters covered by health insurance.

Improve the quality of life for people living with, through and beyond cancer, as well as **improve end-of-life** care for cancer patients.

Vermonters Taking Action Against Cancer (VTAAC) is a statewide collaborative partnership of more than 150 organizations, healthcare providers and individuals working together to reduce the burden of cancer among all Vermonters. VTAAC workgroups and affiliate organizations develop and implement specific strategies and activities to achieve the objectives of the Vermont State Cancer Plan. Activities and progress towards these objectives are routinely assessed and reported annually[8].

For more information about VTAAC, the State Cancer Plan or current activities and progress, click on: http://healthvermont.gov/cancer.

[6] Vermont State Cancer Plan, 2006-2010: http://healthvermont.gov/pubs/cancerpubs/state_cancer_plan.aspx.
[7] A comprehensive strategic plan addressing prevention, detection, treatment, survivorship needs, and palliative care related to Vermont's leading cancers is available at http://healthvermont.gov/cancer/cancer or call (802) 865-7706.
[8] Vermont Cancer Plan Status Report, 2006: http://healthvermont.gov/prevent/cancer/documents/102606Progresssheet.pdf.

Eliminating Cervical Cancer in Vermont

In 2004, **Women In Government**[9] launched the *Challenge to Eliminate Cervical Cancer Campaign*. This bi-partisan initiative mobilizes state legislators to address cervical cancer prevention in their states. In April 2006, the Vermont General Assembly enacted legislation charging the Commissioner of Health to form a Task Force to study the possibility of eliminating cervical cancer in Vermont. This Task Force of policy makers, healthcare advocates, clinicians, and public health professionals considered cervical cancer incidence, mortality, screening recommendations and barriers, as well as prevention of HPV infection, treatment issues and survivorship. In January 2007, the Task Force reported its findings to the Commissioner of Health, who forwarded this report with her comments to the General Assembly as required by the legislation[10]. The recommendations from the Task Force addressed best practices of healthcare providers; information necessary for women and girls; and improved access to health services like HPV vaccinations, cervical cancer screenings, treatment and follow-up care.

The Vermont Task Force to Eradicate Cervical Cancer concluded that Vermont is in a position to reduce the impact of cervical cancer among women. The task force recommended that the Vermont Department of Health provide leadership to develop approaches to work toward access to cervical cancer screening and HPV vaccine for all women who would benefit from them.

The Commissioner of Health has accepted the task force recommendations as follows:

- Assure that clinicians are informed about and apply best practice standards and guidelines regarding HPV vaccinations and testing, cervical cancer screening for women of all ages, treating precancerous conditions and treating cervical cancer.

- Assure that women and their families are informed, have the resources and necessary supports to actively manage their own care in collaboration with the primary care physician and other members of their health care team. This includes understanding causes of HPV infection and cervical cancer, the importance of screening, and the roles of HPV vaccination and testing.

- Assure that policies and practices of regulators, insurers, and healthcare providers remove barriers to affordable and appropriate healthcare for women of all ages, economic, ethnic and cultural groups. These services include vaccination, screening, treatment of precancerous conditions and cervical cancer, and follow-up care for cervical cancer survivors.

The Commissioner of Health has charged the Vermont Department of Health Cancer Control program with integrating these recommendations into the priorities and activities of the Vermont State Cancer Plan and convening appropriate workgroups of Vermont's statewide cancer coalition, Vermonters Taking Action Against Cancer (VTAAC), to develop strategies for implementation. In addition, the department will work with the Office of Vermont Health Access (OVHA), insurers and health care provider organizations to address accessibility and availability of HPV vaccine for Vermont women.

[9] http://www.womeningovernment.org/prevention/

[10] The full report by the Vermont Task Force to Eradicate Cervical Cancer is available at: http://healthvermont.gov/admin/legislature/documents/CervicalCALegRpt013007.pdf

Data Sources

Vermont Cancer Registry: The Vermont Cancer Registry is a central bank of information on all cancer cases diagnosed or treated in Vermont since January 1, 1994. The registry enables the state to collect information on new cases (incidence) of cancer. Previously, the state only kept records on deaths from cancer. The information maintained by the registry allows the Health Department to study cancer trends and improve cancer education and prevention efforts. Suggested Citation: Vermont Department of Health Cancer Registry, 1994-2003. The Vermont Cancer Registry can be contacted at 802-865-7749.

Vermont Vital Statistics: In Vermont, towns are required to file certified copies of death certificates with the Department of Health for all deaths occurring in their jurisdictions. The Health Department is responsible for maintaining the vital statistics system. Suggested Citation: VT Department of Health Vital Statistics System, 1999-2003.

Behavioral Risk Factor Surveillance System: Since 1990, Vermont and 49 other states and three territories track risk behaviors using a telephone survey of adults called the Behavioral Risk Factor Survey. Suggested Citation: Centers for Disease Control and Prevention (CDC). Behavioral Risk Factor Surveillance System Survey Data. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2005.

Surveillance, Epidemiology, and End Results: The National Cancer Institute funds a network of Surveillance, Epidemiology and End Results (SEER) registries. The SEER Program currently collects and publishes cancer incidence and survival data from 14 population-based cancer registries and three supplemental registries covering approximately 26 percent of the U.S. population. These rates are used to estimate the U.S. cancer incidence rates. U.S. incidence is based on the SEER 9 Registries white rates. Suggested Citation: Ries LAG, Eisner MP, Kosary CL, Hankey BF, Miller BA, Clegg L, Mariotto A, Feuer EJ, Edwards BK (eds). SEER Cancer Statistics Review, 1975-2003, National Cancer Institute. Bethesda, MD, 2006. http://www.seer.cancer.gov/csr/1975_2003

U.S. Vital Statistics: The U.S. Public Use Database Vital Statistical System maintains the U.S. mortality rates. Rates presented in this report are for the U.S. white population and were obtained using CDC Wonder. Suggested Citation: United States Department of Health and Human Services (U.S. DHHS), Centers for Disease Control and Prevention (CDC), National Center for Health Statistics (NCHS), Office of Analysis, Epidemiology, and Health Promotion (OAEHP), Compressed Mortality File (CMF) compiled from CMF 1999-2003, Series 20, No. 2G 2004 on CDC WONDER On-line Database.

Technical Notes and Definitions

Age Adjustment: All rates in this document are age-adjusted to the 2000 U.S. standard population. This allows the comparison of rates among populations having different age distributions by standardizing the age-specific rates in each population to one standard population.

Incidence: Incidence refers to the number or rate of newly diagnosed cases of cancer. The incidence rate is calculated as the number of new cervical cancers diagnosed in the state during one year divided by the number of residents in the state during the same year. The incidence data presented in this report were coded using the International Classification of Disease for Oncology (ICD-O) coding system. Cervical cancer cases were defined as invasive neoplasms with ICD-O-3 codes of C53.0-C53.9 with the exception of histology 9590-9989 (or equivalent for older data).

Mortality: Mortality refers to the number or rate of deaths from cancer. The mortality data presented here were coded using the International Classification of Diseases (ICD). Cause of death was coded according to ICD-10.

Race: U.S. incidence and mortality rates for whites, rather than those for all races, are used for comparison because racial minority groups were estimated to make up 3.1 percent of the total Vermont population, compared with the total U.S. non-white population of 19.6 percent in 2004. Nationwide, whites have a higher risk compared to people of other races for female breast, melanoma, and bladder cancer incidence. Whites have a lower risk compared to other races for prostate, colorectal, and cervical cancer. The much smaller populations of Vermont residents of other races may have very different risks of these cancers. Combining data over many years will be required to determine cancer rates.

Federal Poverty Level (FPL): The set minimum amount of income that a family needs for food, clothing, transportation, shelter and other necessities. In the United States, this level is determined by the Department of Health and Human Services. FPL varies according to family size. The number is adjusted for inflation and reported annually in the form of poverty guidelines. Public assistance programs, such as Medicaid in the U.S., define eligibility income limits as some percentage of FPL.

Confidence Intervals: A confidence interval is a range of values within which the true rate is expected to fall. If the confidence intervals of two groups (such as males and females, or Vermont and the U.S.) overlap, then any difference between the two rates is not statistically significant. All rates in this report are calculated at a 95 percent confidence level. For example, the age adjusted Vermont male cancer incidence rate is 580.9 *(567.8, 594.2)* per 100,000 and the Vermont female cancer incidence rate is 446.8 *(436.7, 457.0)*. Since the Vermont female confidence interval and the Vermont male confidence interval do not overlap, a statistical difference exists between the two rates.

Statistical Significance: The use of the terms “higher” and “lower” in this document refer to a “statistically significant” difference. A statistically significant difference indicates that there is statistical evidence that there is a difference that is unlikely to have occurred by chance alone.

Small Numbers: Rates are not presented in this report if they are based on fewer than 6 cases.

Suggested Citation

Vermont Department of Health, Cervical Cancer in Vermont, 2007.

Acknowledgements

This publication was supported by Grant/Cooperative Agreement Number U55/CCU-121972 from the Centers for Disease Control and Prevention. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the Centers for Disease Control and Prevention.